Purpose Comprehensible concerns have been raised regarding the safety of FBS-based culture media. In this talk we discuss the benefits of using human platelet lysate (HPL) for the xeno-free culture of human donor corneas, isolated corneal stromal keratocytes (CSK) and stromal fibroblasts (SF).

Methods 32 human corneas unsuitable for transplantation from 16 human donors were cultured for 25-days in either 2%FBS or 2%HPL medium and compared by phase contrast microscopy (ECD and morphology), and next generation sequencing (NGS). Effects of 0.5%FBS, 5%FBS, 0.5%HPL, 2%HPL and 10%hPL on cultured human CSK and SF were evaluated.

Results Differential cornea culture showed lower endothelial cell loss in the 2%HPL vs. 2%FBS group (ECL hPL=-0.7% vs. FBS=-3.8%; p=0.01). 2%HPL led to the upregulation of cytotoxic, anti-inflammatory and anti-fibrotic genes (e.g. HMOX1, SERPINE1, ANGPTL4, LEFTY2) and the downregulation of pro-inflammatory/apoptotic genes (e.g. CXCL14, SIK1B, PLK5, PPP2R3B). CSK/SF cell viability remained high in all groups (98-100%). Cell numbers and proliferation rates increased (p=0.024-0.001), CSK marker expression decreased with higher fractions of HPL and FBS (p<0.001). SMA1 increased with higher amounts of FBS (p=0.003) but decreased with incremental HPL substitution in both cell types (p=0.014). HPL contained more TGF-β1 (100%hPL 1.861 ±0.231ng/ml vs. 100%FBS 0.015±0.010ng/ml, p<0.001), bFGF and HGF were only detectable in 100% hPL (bFGF 0.067±0.017ng/ml, HGF 1.074±0.050ng/ml).

Conclusion 2%HPL is a suitable xeno-free substitution for 2% FBS in human cornea organ culture, inducing less ECL and potentially beneficial alterations in gene expression. CSK and SF can be cultured with xeno-free hPL. To maintain CSK characteristics substitution must remain minimal (0.5% hPL/FBS). hPL contains the antifibrotic HGF and bFGF, suppressing myofibroblast conversion.

Purpose To report on the occurrence of guttae in corneal donor tissue.

Material & Methods Retrospective database study of discard reasons for corneal donor tissue at Amnitrans EyeBank Rotterdam (AER) for the period from January 2019 to December 2021 and the outcome of an eight-question survey sent to European Eye Bank Association corresponding members addressing the occurrence of corneal guttae and the practice pattern regarding donor tissue with guttae.

Results Between 2019 and 2021 6039 donor corneas were processed at AER. Average discard rate because of guttae in this period was 9 (+-4)% (n=552). Most corneas were discarded because of guttae at first evaluation (8%, n=481). Monthly discard rate because of guttae ranged from 3% to 19%. Yearly discard rates related to corneal guttae were 10 (+-3)%; 8 (+-2)% and 11 (+-5)% in 2019, 2020 and 2021, respectively. Average endothelial cell density (ECD) at the first evaluation from 2019-2021 was 2486 (+-93) cells/mm2, with average monthly ECD ranging from 2343 to 2642 cells/mm2.